the polluter. This can be done by outright punitive action by the federal government. If one calls the *federal* air pollution office here in San Francisco about a specific problem, he will be immediately referred to a *local* enforcement agency. Why? Because there are no enforceable federal laws to place the burden of the cost of polluting the community on the offender.

Wolfle is correct in feeling that practical solutions can best come from industry itself. The difficulty is that there is no incentive. If the housewife could bring her fly-ash-covered linen to the president of an industry for rewashing and if the husband could demand the board of directors repaint his house; if the emphysema patient could insist the stockholders donate their lungs, then you can be sure industry would have an incentive and would find a solution.

Industry is not necessarily the sole culprit. Many fine companies treat their effluents effectively, but not because they are so compelled by strict laws. They do so to improve public relations or to recover a by-product. It does not matter who is the polluter. It matters that if the polluter is made to bear the cost of pollution (rather than the public), the polluter will soon find a way to stop polluting.

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Immobilizing Drugs Lethal to Swimming Mammals

Recent widespread use of central-nervous-system depressants in capture or restraint of wild animals has led to expansion of attempted telemetric experiments by greatly facilitating attachment of sensor-transmitters. In general, the use of many of these drugs on land animals has been successful once the appropriate dosage has been determined. For aquatic mammals in the water (especially cetaceans) attempts to use these drugs have been disastrous.

With very few exceptions, aquatic mammals swim with slightly negative buoyancy (that is, they are heavy rather than neutral or light), so that immobilization leads to sinking and drowning. Moreover, to simplify the situation a little, cetaceans breathe less automatically and more "on command" than terrestrial forms. As a result, early attempts to anesthetize porpoises led

to death. Lilly, reporting experiments in 1955 by a team of eight neurologists, said, "These animals, in contrast to dry land ones, fail to breathe with relatively light doses of anesthetic, one-fourth that required for surgical levels of anesthesia. In other words, they lack our unconscious, automatic, self-sustaining breathing system" (*1*). In 1964 Nagel, Morgane, and McFarland (*2*) reported an ingenious technique for porpoise anesthesia, later extended by Ridgway (*3*). This involves dislodging and intubating the larynx, and, for this and other reasons, is suitable only for operating-room conditions, not for field use on free-swimming wild animals.

In summary, the use of presently known drugs to immobilize an aquatic mammal in the water is almost certain to kill the animal by suffocation, either by allowing it to sink or by stopping breathing, or both.

It is, of course, possible that a combination of drug and technique may be developed (we know of one thoughtful colleague who is engaged in this task), but it must be emphasized that such studies should be begun on captives under conditions that permit adequate autopsy of mistakes. There have recently been several attempts, for the most part not reported in the literature, to immobilize free-swimming cetaceans, resulting in the pointless death of a number of whales, none of which appears to have been recovered even as a carcass for useful study.

Apparently reports on only two such attempts on cetaceans have been published. One (*4*) was incomplete, and in another (*5*), fortunately, the whales eluded the would-be anesthetist. Three recent papers on immobilizing seals (*6*) are confined to animals out of water.

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